

INEEL Cuber Facility and the Coal Fired Steam Generator Facility (CFSGF)

In accordance with the DOE mission to support research and development and partnering to develop alternative energy and reduce environmental pollution EM77 authorized \$250,000 to perform testing and development at the ICPP cuber facility and the CFSGF.

This project is in cooperation with DynaMotive Technologies Corporation a company with offices in the United States, England and Vancouver, British Columbia, Canada. DynaMotive Technologies Corporation has developed a patented product called BioLime. This product has been laboratory and pilot tested and proven to reduce SO_x and NO_x emissions in excess of 90% when burned with coal. It has recently been discovered that BioLime has the propensity to reduce HCl emissions as well.

The INEEL - DynaMotive cooperative agreement to do research and development and full scale power plant testing was reached after representatives from DynaMotive company and the trade manager from British Columbia Government, Ministry of Employment and Investment, Trade and Investment Office visited the INEEL in the summer of 1997. They saw the cuber facility and the CFSGF and recognized the capability to perform full scale testing of BioLime. It should also be mentioned that the Government of British Columbia has a Memorandum of Understanding between INEEL (signed by Barton Krawitz of INEEL and Candis Webb, of DOE Idaho) and five states and the DOE and PNL facilities at Hanford. This agreement calls for industrial collaboration, testing and technology transfer.

BioLime is a product obtained from a unique DynaMotive process known as BioTherm pyrolysis. This process takes bio mass products (i.e. wood, agriculture, and any other organic bio mass waste) and produces BioOil from which BioLime is produced.

The INEEL project to test the BioLime is currently in progress. This project will develop ways to incorporate the BioLime into the cubes being produced at CPP-653 and then burn the cubes in the CFSGF to monitor the emission changes caused by the BioLime. With the successful completion of the test the agreement provides for the further testing to determine the emission reduction with higher sulfur coals and greater quantities of Processed Engineered Fuels (PEF) (cubes).

Also, there will be further discussions to determine if a pilot plant could be built at the INEEL to process straw, municipal solid waste and other agriculture wastes to produce BioOil, BioLime and PEF. This action would require the availability of the cuber facility and the CFSGF to perform testing and use the PEF to fuel the CFSGF. Furthermore, INEEL may also assist DynaMotive, upon successful completion of the test, in scaling up the pyrolyser and also explore the possibility to transfer INEEL's membrane technology to extract high value chemicals from the BioOil, without losing the NO_x/SO_x/HCl reduction properties of BioLime. As a result the availability of the CFSGF will be critical for future tests.

Another value added from the BioOil and BioLime research is a paper brightener product, which would complement DOE 2020 program for the US forestry industry sector.

DynaMotive Technologies Corporation has been active in developing this BioOil, BioLime technology, which will certainly reduce greenhouse gas and allow the US industry to obtain greenhouse gas credits, and will contribute to the United States coal fired power plant utility industry to meet the US greenhouse gas emission commitments which are currently under discussion as a result of the Kyoto conference in Japan. Furthermore, DynaMotive has been making major inroads in converting various animal derived organic waste forms into BioOil with direct applications to Eastern Europe and the Far East. Successful completion of these tests will allow INEEL the opportunity to further increase its industrial collaboration with DynaMotive. To that end INEEL, has already identified some key US companies that could become strategic partners to a possible joint INEEL/ DynaMotive relationship, including: Duke Power, Shell US, and Lockheed Martin when introducing this technology into the emerging markets.

Since these conferences representatives from Japan, Poland and other Canadian Provinces have visited the DynaMotive offices to discuss the BioOil, and BioLime technology.

Key to the research and development of the BioLime and PEF, the further testing of higher sulfur coal, higher percentage of PEF, and BioOil derived from other agriculture and municipal type wastes is the availability of a full scale operating cuber and coal fired facility like the facility at ICPP. There is no place in the United States or the world that has a full scale operational cubing and coal fired boiler facility that can also provide the testing platform that is available at the ICPP.

The operating cuber and CFSGF and the BioLime project provides the INEEL and DOE the opportunity to be the leaders in the world in this area of alternative fuel development, environmental protection, and partnering.

Additionally,

In March of 1998 three assistant under secretaries of the DOE -HQ (including Denise Swenk and Thomas Gross) as well as representatives of INEEL, are attending the Globe 98 environmental conference in Vancouver, B. C. At the invitation of the B. C. Government LMITCO has also been invited to participate. Several LMITCO personnel are attending to present papers and publicize the availability, skills and opportunities for partnering with the INEEL and DOE and the BioLime project.

There has also, been interest from the American Plastics Council to participate in the BioLime project.

There have been discussions with the 3M Company, the Tooele Army Depot, and the Slovakia Ministries about the cubing and burning of PEF and participation with the INEEL to develop PEF.

There has also been discussion and DynaMotive is considering if BioLime could reduce the NO_x in the NWCF stack.